

**Expanded Site Inspection Report  
Keysor Century Corporation  
Saugus, California**

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**LIST OF ACRONYMS**

AOC	Analyte of Concern
ARCH	Air Rotary with Casing Hammer
AST	Aboveground Storage Tank
bgs	below ground surface
BOD	Biochemical Oxygen Demand
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CHA	Cabrina, Hearn, and Associates
CLPAS	Contract Laboratory Program Analytical Services
CSD	County Sanitation Districts of Los Angeles
CUPA	Los Angeles County Certified Unified Program Agency
DCA	Dichloroethane
DCE	Dichloroethene
DCP	Dichloropropane
DTSC	Department of Toxic Substances Control
E & E	Ecology & Environment, Inc.
EPA	United States Environmental Protection Agency
ESI	Expanded Site Inspection
FIT	Field Investigative Team
Freon 113	1,1,2-trichloro-1,1,2-trifluoroethane
HRS	Hazard Ranking System
HSA	Hollow Stem Auger
LACDPW	Los Angeles County Department of Public Works
LACFD	Los Angeles County Fire Department
mg/l	milligrams per liter
NPDES	National Pollutant Discharge Elimination System
NFA	No Further Action
NFRAP	No Further Remedial Action Planned
NOV	Notice Of Violation
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List

**List of Acronyms (continued)**

OVA	Organic Vapor Analyzer
PA	Preliminary Assessment
PCE	Tetrachloroethylene
PEA	Preliminary Endangerment Assessment
PID	Photoionization Detector
ppm	parts per million
PVC	Polyvinyl chloride
RAMCO	RAMCO Environmental, LLC
RCRIS	Resource Conservation and Recovery Information System
RWQCB	Los Angeles Regional Water Quality Control Board
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act
SCAQMD	South Coast Air Quality Management District
SI	Site Inspection
SVOC	Semivolatile Organic Compound
TCE	Trichloroethylene
TMB	Trimethylbenzene
TRIS	Toxic Release Inventory System
USACE	United States Army Corps of Engineers
UST	Underground Storage Tank
VOC	Volatile Organic Compound
WRP	Water Reclamation Plant
µg/kg	Micrograms per kilogram
µg/l	Micrograms per liter

## 1.0 INTRODUCTION

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), Weston Solutions, Incorporated (WESTON®) has been tasked to conduct a Hazard Ranking System (HRS) Expanded Site Inspection (ESI) of the Keysor Century Corporation (Keysor) site, located in Saugus, Los Angeles County, California. The HRS assesses the relative threat associated with actual or potential releases of hazardous substances to the environment, and has been adopted by the U.S. Environmental Protection Agency (EPA) to assist in setting priorities for further site evaluation and eventual remedial action. The HRS is the primary method for determining a site's eligibility for placement on the National Priorities List (NPL). The NPL identifies sites where the EPA may conduct remedial actions.

The site was identified as a potential hazardous waste site and entered into the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) on November 1, 1979 (CAD009531591). A State-funded Preliminary Assessment (PA) was completed November 1, 1984 and an EPA-funded PA was completed November 23, 1988. An EPA-funded Site Inspection (SI) was completed on October 15, 1990 and a No Further Remedial Action Planned (NFRAP) decision was made and the site was archived (1). The purpose of this evaluation was to assess the threat(s), if any, posed to public health, welfare, or the environment by the site, and to determine if further investigation under CERCLA/SARA is warranted.

After reviewing the previous investigations conducted on the Keysor site, the EPA decided that further investigation would be necessary to more completely evaluate the site using the EPA's HRS criteria. This report summarizes the results of the ESI for the Keysor site.

More information about the Superfund program is available on the EPA web site at <http://www.epa.gov/superfund>. The attached fact sheet describes EPA's site assessment process (Appendix F).

### 1.1 Apparent Problem

The apparent problems at the site, which contributed to EPA's determination that an ESI was necessary, are presented below:

Since 1958, the Keysor site had been operating as a resin compound manufacturer facility, producing polyvinyl chloride (PVC) resins and compounds. The polyvinyl chloride resins and compounds were produced from a polymerization reaction that used volatile organic compounds (VOCs) as raw materials (2).

Until at least 1980, the cleaning solvent ethylene dichloride (i.e., 1,2-dichloroethane [1,2-DCA]) was utilized to clean reactor vessels on the Keysor site. During early operations, Keysor used an unlined pond located on site for disposal of waste liquids and solids produced from the reactor

area. As early as January 1961, it was observed that the disposal of wastewater to the pond was inadequate due to excess water flowing to adjacent properties. The Los Angeles County Board of Supervisors ordered the elimination of the wastewater pond in April 1977, however, the pond continued to be used through September 1977 when sampling of the pond indicated elevated concentrations of 1,2-DCA and vinyl acetate (2, 3, 4, 5, 6, 7, 8).

In 2002, numerous spills on the Keysor site were reported. Process water and wastewater containing vinyl chloride, vinyl acetate, and trichloroethylene (TCE) had been released in quantities ranging from 100 to 1,000 gallons (9).

## **2.0 SITE DESCRIPTION**

### **2.1 Location**

The Keysor site is located at 26000 Springbrook Avenue, Saugus, California. The geographic coordinates for the site are 34°24' 46" North latitude and 118°32' 21" West longitude. The site location is presented in Figure 1.

### **2.2 Site Description**

The Keysor site is approximately 32 acres and is bound to the north by undeveloped land and to the east by Whittaker Corp-Bermite Division (CAD064573108). Foothill Electric Motors, 4M Grinding, Springbrook Avenue, and Leonards Molded Products are located south of the site. The site is bound to the west by American Builders Supply; and further west by a railroad line and San Fernando Road (2, App. B).

During the time of Keysor's operations, approximately 24 acres of the site consisted of undeveloped hills covered with grasses and shrubs. The remaining 8 acres included several structures and processing areas. Two main buildings existed on the Keysor site. One building included the office, main control room, and the maintenance shop, and the other building was the manufacturing plant. There were an additional five office trailers, a storage trailer, a training trailer, a warehouse, an instrument shop, and an equipment building. The resin manufacturing areas included boilers, reactors, slurry tanks, a tank farm, a cooling tower, and storage silos. Other areas included finished product silos and a truck and rail loading area. An incinerator, caustic tank, and waste oil storage area were located east of the resin manufacturing area. This eastern portion of the site is where the former wastewater pond was located. The 550-Plant, located on the north side of the site, was a wastewater treatment area. Also located on site were several sumps and two outfalls (Outfall 001 and Outfall 002) that drained to the public sewer system (10, App. B). An historic site layout map of Keysor during the time of operations is presented in Figure 2.

In April 2004, the Keysor site underwent demolition and reconstruction activities. The incinerator and caustic tank, the drum storage area, and the monomer recovery tower were

removed. In addition, Keysor contracted RAMCO Environmental, LLC (RAMCO) to remove nine sumps from the property (11, App. B).

### **2.3 Operational History**

From 1971 to December 2003, the Keysor property was owned and operated by Keysor Century Corporation. It is unknown who owned the property prior to 1971, however in the late 1960's to early 1970's, the business changed its name from Keysor Chemical Company to Keysor Century Corporation. In December 2003, Saugus Industrial Center, LLC purchased the property and currently leases the site to several businesses (12, App. C-1, App. B).

From 1958 to 2003, Keysor operated a PVC manufacturing facility. By 1974, operations included record manufacturing and the production of PVC and polyvinyl acetate resins and compounds. The production processes involved polymerization, flash drying, extrusion, and compression molding. Raw materials used in these operations included vinyl chloride, vinyl acetate monomers, TCE, and toluene. In addition, 1,2-DCA was used to clean the polymer reactors until approximately 1980 (2, 3, 12, 13).

Prior to the construction of the sewer system in 1963, waste was exclusively disposed of in the unlined pond under Industrial Waste Disposal Permit No. 1928 issued November 13, 1958. After 1963, wastes from the centrifuge area, the boiler blow down, and the print shop area were discharged to the sewer. Wastes from the reactor area continued to be discharged to the unlined pond (4, 12).

In January 1974, Keysor was ordered to stop discharging any wastewater to the unlined pond. During this time, wastewater from floor cleanup and cooling, and process water containing resin waste were discharged to an unlined drainage channel located in the front of the plant along the railroad right-of-way, which eventually drained into the South Fork of the Santa Clara River. Keysor was ordered to cease all discharge to the drainage ditch, however, Keysor was cited for discharging to the drainage ditch in October 1974 and December 1977 (14, 15, 16).

In July 1974, the Saugus-Newhall Water Reclamation Plant (WRP) began accepting wastes from the Keysor site, however analytical testing determined that concentrations of 1,2-DCA exceeded acceptable levels. Keysor was advised that wastewater would no longer be accepted in the Sanitation Districts system until toxic materials were eliminated. In July 1975, a permit was issued to Keysor for the construction of pretreatment facilities in order to eliminate the discharge of toxic concentrations of 1,2-DCA (17).

In November 1976, an inspection conducted by the Los Angeles County Engineer revealed that Keysor was continuing to discharge wastewater to the unlined pond. Large quantities of solid material and globules of colored insoluble materials were observed in the pond at the time of the inspection. Sprinklers were observed discharging pond effluent to the slopes surrounding the pond. In addition, a 2-inch pipe was observed leading away from the process area to an

undetermined destination toward the north and south of the pond (5).

In January 1977, Los Angeles County requested that Keysor submit a plan outlining the elimination of the pond and the safe disposal of pond residues. By March 1977, the onsite wastewater pretreatment facilities were complete, however sampling results revealed elevated concentrations of 1,2-DCA and vinyl acetate unacceptable to the Saugus-Newhall WRP. In April 1977, Keysor continued to discharge wastewater containing 1,2-DCA and other organic pollutants to the ground surface and the unlined pond. By October 1977, the unlined pond on the Keysor site had been removed. Wastewater and waste residue were removed and disposed of in compliance with the Los Angeles County Engineer. By May 1980, 1,2-DCA was no longer used as a cleaning solvent on the Keysor site (8, 17, 18, 19, 20).

In the late 1970's, Keysor was fined twice for inadequate engineering controls and unacceptable amounts of vinyl chloride gas in the air. The South Coast Air Quality Management District (SCAQMD) had issued numerous violations between 1979 and 1983 for elevated concentrations of chemical emissions to air. All violations were caused by leaking valves, equipment failure, or employee errors. In 1988 and 1990, the SCAQMD conducted ambient air sampling in the vicinity of the Keysor site. Both sampling events indicated elevated concentrations of vinyl chloride (2, 21).

Since the completion of the onsite wastewater pretreatment plant, TCE, vinyl chloride, and vinyl acetate remained as the principal raw materials until the resin manufacturing ceased in 2003. These materials were stored in aboveground storage tanks (ASTs) in bermed areas in proximity to the reactors and adjacent to the cooling tower, except for one AST storing vinyl chloride situated outside the bermed area. Vinyl chloride was delivered to the site by railcars, and TCE and vinyl acetate were delivered by tanker trucks. Vinyl chloride, vinyl acetate, and TCE were conveyed to reactors through underground piping across a walkway between the reactor and the hazardous material storage area. Reportedly, over 50 million pounds of VOCs were used as raw materials annually by Keysor. The raw materials were mixed in the reactors with other ingredients such as suspension agents, defoamers, water and inhibitors. The finished product went through slurry tanks, centrifuges, dryers, and cyclones to the baghouse and silos. Wastewater generated from this operation was conveyed through underground vitrified clay piping to the 550 Plant for pretreatment after which it was pumped to Sump 10. Water from this sump was pumped up to the packed tower air stripper. Treated VOC-stripped water was transmitted by piping and collected in the main sump adjacent to the reactor area from where it was sent back to a 20,000-gallon holding tank in the 550 Plant area. The pH of this effluent was adjusted in a surge pond after which the treated wastewater was discharged to the sewer system through a 4-stage clarifier (9, 13).

In December 2000, Keysor contracted Ninyo and Moore Geotechnical and Environmental Sciences Consultants to conduct a Phase I assessment on the property. The report recommended that sub-surface soil and groundwater sampling be conducted in areas of possible vinyl chloride and TCE impact. In June 2001, another Phase I Environmental Site Assessment was conducted

by EMG. EMG recommended a subsurface investigation in the area of the former wastewater pond (10, 22).

In May 2001, EMG conducted a Phase II Environmental Assessment of the Keysor site. Soil samples were collected within the graded fill material at the site of the former wastewater pond and analyzed for VOCs. Analytical results indicated the presence of TCE, 1,2-DCA, cis-1,2-dichloroethene (cis-1,2-DCE), vinyl chloride, toluene, and benzene. Maximum concentrations of each analyte detected were as follows: 15 micrograms per kilogram ( $\mu\text{g/kg}$ ) TCE; 17  $\mu\text{g/kg}$  1,2-DCA; 11  $\mu\text{g/kg}$  cis-1,2-DCE; 19  $\mu\text{g/kg}$  vinyl chloride; 130  $\mu\text{g/kg}$  toluene; and 2  $\mu\text{g/kg}$  acetone (23). More information regarding this sampling event is discussed in Section 3.1.

An Additional Phase II Environmental Assessment was performed at the Keysor site by EMG in May 2001. The assessment consisted of advancing three hollow stem auger soil borings to install soil vapor probes in the area of the former pond and locations where detectable concentrations of VOCs were previously reported in shallow subsurface soil. Analytical results of the soil samples indicated the presence of tetrachloroethylene (PCE), TCE, 1,2,4-trimethylbenzene (1,2,4-TMB), xylenes, 1,3,5-TMB, 1,2-DCA, cis-1,2-DCE, toluene, and vinyl chloride. Maximum concentrations of each analyte detected were as follows: 1  $\mu\text{g/kg}$  PCE; 1  $\mu\text{g/kg}$  TCE; 4  $\mu\text{g/kg}$  1,2,4-TMB; 2  $\mu\text{g/kg}$  xylenes; 1  $\mu\text{g/kg}$  1,3,5-TMB; 4  $\mu\text{g/kg}$  1,2-DCA; 9  $\mu\text{g/kg}$  cis-1,2-DCE; 12  $\mu\text{g/kg}$  toluene; and 2  $\mu\text{g/kg}$  vinyl chloride. Due to low concentrations of VOCs detected in soil vapor and subsurface soil samples, EMG found no evidence of a significant release and recommended that no further investigation was warranted at that time (24). More information regarding this sampling event is discussed in Section 3.1.

In November 2003, RAMCO completed a Preliminary Site Investigation of the Keysor site. A soil vapor survey was conducted, and based on the results soil samples were collected at areas of elevated vapor concentrations. Analytical results indicated the presence of toluene and TCE. In April 2004, RAMCO removed 9 sumps from the Keysor site as part of the closure plan submitted to the County of Los Angeles Department of Public Works (LACDPW). Confirmation soil samples were collected beneath each sump location (25). More information regarding this sampling event is discussed in Section 3.1.

## 2.4 Regulatory Involvement

The following agencies were contacted in the course of conducting the ESI: The Los Angeles Regional Water Quality Control Board (RWQCB), the Cypress and Glendale offices of the Department of Toxic Substances Control (DTSC), the Los Angeles County Fire Department (LACFD), the County Sanitation Districts of Los Angeles County (CSD), and the LACDPW. All agencies responded that there were files on record for the Keysor site (App. C-2, C-3, C-4, C-5, C-6, C-7). The details of these agencies' involvement with the site are presented below.

### **2.4.1 U.S. Environmental Protection Agency**

The Keysor site is listed in the Resource Conservation and Recovery Information System (RCRIS) database as a small quantity generator (EPA ID: CAD009531591) (26).

In addition, the Keysor site is listed in the Toxic Release Inventory System (TRIS). The following chemicals are listed as being released from the Keysor site: lead compounds, sodium hydroxide, toluene, TCE, vinyl acetate, and vinyl chloride (27).

In August 1988, EPA tasked the Ecology and Environment, Inc. (E & E) Field Investigative Team (FIT) to conduct a Reassessment of the Keysor site. The FIT recommended a High Priority Screening Site Inspection for the Keysor site due to a number of factors including, but not limited to: a documented air release, inadequate containment facilities, and a large quantity of waste (28).

In August 1989, EPA tasked the FIT to conduct a Screening Site Inspection of the Keysor site. The FIT, with EPA concurrence, determined that no sampling on the Keysor site was necessary at that time. In December 1990, a NFRAP decision was made and the site was archived (1, 2).

### **2.4.2 California Environmental Protection Agency, Regional Water Quality Control Board, Los Angeles Region**

Since June 1977, Keysor had been a National Pollutant Discharge Elimination System (NPDES) permit holder through the RWQCB. In addition, the EPA referred the Keysor facility to the RWQCB for further evaluation and transmitted information documenting numerous non-permitted releases of wastewater containing TCE, vinyl chloride, and vinyl acetate to unpaved soils. Keysor was permitted to discharge stormwater from rain runoff. Stormwater was collected in two sumps: Sump 4 and Sump 8. During rainfall, automatic valves diverted stormwater collected in Sump 4 to Outfall 001 and water in Sump 8 to Outfall 002. From the outfalls the water was diverted to an unlined ditch which leads to the South Fork Santa Clara River, a tributary to the Santa Clara River. The water was not treated prior to being diverted to the ditch (App. B, 29, 30, 31).

The RWQCB has conducted several inspections on the Keysor site. On August 24, 2002, an inspection revealed that there was a significant potential for impact to soil and groundwater by hazardous substances on the Keysor site. A review of self-monitoring reports revealed several violations including, but not limited to: missing monitoring data; effluent limit violation of biochemical oxygen demand (BOD<sub>5</sub>), pH, chloride, nitrate and nitrite, and TCE; and elevated concentrations of acetone and vinyl acetate. The inspection report also indicated that the RWQCB responded to two spill incidents on the Keysor site on October 18, 2001 and October 19, 2001. On October 18, 2001, approximately 3,000 gallons of a white substance spilled and flowed into the South Fork Santa Clara River. On October 19, 2001, approximately 500 gallons of water containing a white substance was observed flowing on the west side of the site near the

railroad tracks and draining into the South Fork Santa Clara River. On September 17, 2002, an inspection was performed by the RWQCB in response to several hazardous material spill incidents on the site. The RWQCB was concerned about the numerous releases on site and the potential for impacting soil and groundwater beneath the site. It was recommended that material and waste handling practices be improved (9, 30).

#### ***2.4.3 California Environmental Protection Agency, Department of Toxic Substances Control***

The Keysor site is listed in the Site Cleanup - Site Mitigation and Brownfields Reuse Program Database (Calsite ID: 19280025). In February 1995, a No Further Action (NFA) for Site Mitigation Operations decision was made (32).

In May 1984, a preliminary assessment summary was conducted by the Department of Health Services, Toxic Substances Control Division (now known as the DTSC). It was recommended that the site be further investigated with emphasis on the impact of toxic materials on the site and their possible migration to groundwater (21).

On November 26, 1990, DTSC completed a Preliminary Endangerment Assessment (PEA) Site Screening on the Keysor site. There were no visible problems at the site and no violations were issued. A low priority PEA was recommended (33).

#### ***2.4.4 South Coast Air Quality Management District***

The SCAQMD is the primary regulatory agency for air emissions. Numerous violations have been issued due to excessive emissions of vinyl chloride and nitrogen oxide, and failure to maintain equipment (28).

In the late 1970's, Keysor was fined twice for inadequate engineering controls and unacceptable limits of vinyl chloride gas in the air. The SCAQMD issued numerous violations between 1979 and 1983 for elevated concentrations of chemical emissions to air. All violations were caused by leaking valves, equipment failure, or employee errors. In 1988 and 1990, the SCAQMD conducted ambient air sampling in the vicinity of the Keysor site. Both sampling events indicated elevated concentrations of vinyl chloride (2, 21).

#### ***2.4.5 Los Angeles County Certified Unified Program Agency***

In March 2002, the LACFD referred the Keysor site to the DTSC and the RWQCB due to repeated hazardous waste and/or materials being released into the environment (34, 35).

Between October 2001 and October 2002, numerous onsite spills were documented with the LACFD Health Hazardous Materials Division. Wastewater and process water suspected of containing vinyl acetate, vinyl chloride, and/or TCE were the most common materials spilled. An overview of these spills is presented in Table 1. In addition, the Los Angeles County

Certified Unified Program Agency (CUPA) has conducted on-site inspections of the Keysor site and issued several notices of violation (NOVs). Violations observed on the Keysor site include lack of hazardous waste determination and hazardous waste labeling, and hazardous materials being released to the environment (30, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63).

In October 2001, the LACFD collected samples from a grated drain on the Keysor property in response to the spill that occurred on the site. Results indicated the presence of numerous VOCs including, but not limited to: vinyl chloride, 1,1-DCA, cis-1,2-DCE, and TCE (64).

#### ***2.4.6 County Sanitation Districts of Los Angeles County***

The CSD has been involved with the Keysor site since the early 1960s issuing industrial wastewater discharge permits and conducting industrial wastewater sampling oversight. The site has had numerous violations of the permit, including discharging excessive quantities of vinyl chloride, 1,2-DCA, chloroform, and TCE to the sewer (65, 66, 67, 68, 69, 70).

#### ***2.4.7 Los Angeles County Department of Public Works***

The County of Los Angeles, Department of County Engineer Project Planning and Pollution Control Division, now known as the LACDPW, has been actively involved with the Keysor site since at least 1974. In September 1977, the LACDPW collected samples from the unlined pond on the Keysor site. Analytical results indicated the presence of 1,2-DCA and vinyl acetate. A 1978 inspection conducted by the LACDPW confirmed that the unlined pond had been eliminated from the Keysor property (7, 14, 71).

In June 2004, an Industrial Waste Water Sump Removal Closure report was submitted to the LACDPW. Soil sampling was not required by the LACDPW due to EPA's current involvement with the site (11, 72).

### **3.0 INVESTIGATIVE EFFORTS**

#### **3.1 Previous Sampling**

##### ***3.1.1 Pond Sampling***

In 1977, the LACDPW collected water samples from the unlined pond on the Keysor site. Analytical results indicated the presence of 1,2-DCA at 20.7 milligrams per liter (mg/l) and vinyl acetate at 735 mg/l (7).

##### ***3.1.2 Soil Sampling***

In May 2001, EMG conducted a Phase II Environmental Assessment of the Keysor site. Soil

samples were collected within the graded fill material at the site of the former wastewater pond located in the eastern portion of the site. The samples were collected by advancing nine Geoprobe soil borings. Soil borings were advanced to a maximum of 15 feet below ground surface (bgs). The soil samples were collected near the surface and at 4-foot intervals from the soil borings. Soil samples were collected in glass jars or core liners and analyzed for VOCs using EPA Method 8260. Analytical results indicated the presence of VOCs including TCE, 1,2-DCA, cis-1,2-DCE, vinyl chloride, toluene, and benzene. Maximum concentrations of each analyte detected were as follows: 15 µg/kg TCE; 17 µg/kg 1,2-DCA; 11 µg/kg cis-1,2-DCE; 19 µg/kg vinyl chloride; 130 µg/kg toluene; and 2 µg/kg acetone. These elevated concentrations of VOCs were detected at sample locations in the eastern and south-central portion of the former wastewater pond area (23).

An Additional Phase II Environmental Assessment was performed at the Keysor site by EMG in May 2001. The assessment consisted of advancing three hollow stem auger soil borings to install soil vapor probes in the area of the former pond and locations where detectable concentrations of VOCs were previously reported in shallow subsurface soil. Soil borings were advanced to a depth of approximately 30 feet bgs and soil samples were collected from 10, 20, and 30 feet in each of the borings. Soil samples were collected in glass jars and analyzed for VOCs using EPA Method 8260. Analytical results of the soil samples indicated the presence of PCE, TCE, 1,2,4-TMB, xylenes, 1,3,5-TMB, 1,2-DCA, cis-1,2-DCE, toluene, and vinyl chloride. Maximum concentrations of each analyte detected were as follows: 1 µg/kg PCE; 1 µg/kg TCE; 4 µg/kg 1,2,4-TMB; 2 µg/kg xylenes; 1 µg/kg 1,3,5-TMB; 4 µg/kg 1,2-DCA; 9 µg/kg cis-1,2-DCE; 12 µg/kg toluene; and 2 µg/kg vinyl chloride. These elevated concentrations of VOCs were detected at sample locations in the eastern, central, and western portion of the former wastewater pond area. Due to low concentrations of VOCs detected in subsurface soil samples, EMG found no evidence of a significant release and recommended that no further investigation was warranted at that time (24).

In November 2003, RAMCO completed a Preliminary Site Investigation of the Keysor site. Soil samples were collected in the processing area from 10 locations at various depths at a maximum of 4 feet bgs. Soil borings were advanced using a hand auger and the soil samples were collected directly from the hand auger and containerized in glass jars. Analytical results indicated the presence of toluene (430 µg/kg) at one location in the southern portion of the processing area, and TCE (15 µg/kg) at one location in the northeast portion of the processing area (25).

In April 2004, RAMCO removed nine sumps from the Keysor property in the former processing area. RAMCO collected soil samples from 14 locations on the Keysor site. Soil samples were collected at approximately 2 feet beneath each sump. Multiple samples, primarily in the vicinity of piping connections, were taken at the larger sumps. An additional sample was collected at the underground drain lines. Samples were collected using a 6-inch metal core tube and analyzed for metals using EPA Method 6010B/7471A, VOCs using EPA Method 8260B, semivolatile organic compounds (SVOCs) using EPA Method 8270C, and/or oil and grease using EPA Method 413.2. Analytical results indicated the presence of TCE beneath one sump located in the northwest

portion of the processing area at a concentration of 11 µg/kg. In addition, toluene was detected beneath two sumps at concentrations of 10 µg/kg, in the southwest portion of the processing area, and 4 µg/kg, in the south-central portion of the processing area. All samples were non-detect for SVOCs, and metals were detected at concentrations representative of background levels (11).

### ***3.1.3 Soil Vapor Sampling***

During the Additional Phase II Environmental Assessment performed by EMG in May 2001, soil vapor probes in the area of the former pond and locations where detectable concentrations of VOCs were previously reported in shallow subsurface soil were installed. Soil borings were advanced to a depth of approximately 30 feet bgs, in which soil gas probes were installed at 10, 20, and 30 feet bgs in each boring. Soil vapor samples were collected and delivered to a mobile laboratory for VOC analysis. Analytical results indicated the presence of TCE, 1,2-DCE, toluene, and vinyl chloride. Maximum concentrations of each analyte were as follows: 1.8 µg/l TCE; 3.9 µg/l 1,2-DCE; 2.4 µg/l toluene; and 1.7 µg/l vinyl chloride. Due to low concentrations of VOCs detected in soil vapor, EMG found no evidence of a significant release and recommended that no further investigation was warranted at that time (24).

RAMCO conducted a soil vapor survey during the November 2003 Preliminary Site Investigation of the Keysor site. Soil vapor ports were installed primarily in the vicinity of the former unlined pond and in the vicinity of the mixers and reactors and tank storage areas. The ports were installed at 35 locations at a depth of 18 inches bgs. Each probe hole was plugged temporarily with a cork. After approximately 15 minutes, the cork was removed and the probe of an organic vapor analyzer (OVA) was inserted to approximately 6 to 8 inches bgs. The reading of vapor concentrations was recorded at each port location. Results indicated that the maximum concentrations of vapors were located in the vicinity of the tanks and reactors in the process area (25).

### ***3.1.4 Groundwater Sampling***

RAMCO intended to sample groundwater beneath the site during the November 2003 investigation, however groundwater was not encountered at the two assigned locations. The two boring locations were located along the western boundary of the site and assumed to be representative of the site's downgradient boundary. One boring was advanced to 50 feet bgs and groundwater was not encountered. However, between 25 and 40 feet bgs the soil moisture was close to saturation. The second borehole was advanced to 28 feet bgs when drilling ceased due to refusal. Groundwater was not encountered at this boring (25).

### ***3.1.5 Wastewater Sampling***

In April 2001, wastewater was sampled by Keysor as part of the Industrial Wastewater Self Monitoring Report required by the CSD. Samples were analyzed for VOCs using EPA Method 601/602 and for SVOCs using EPA Method 625. Analytical results indicated the presence of

TCE, chloroform, and 1,1,1-TCA at concentrations of 28.3 µg/l, 3.7 µg/l, and 1.4 µg/l, respectively (73).

In October 2001, LACFD collected samples from a grated drain on the Keysor property in response to the spill that occurred on the site. Results indicated the presence of numerous VOCs. Concentrations for selected analytes were as follows: 218 µg/l vinyl chloride, 0.7 µg/l 1,1-DCA, 19.7 µg/l cis-1,2-DCE, 2.54 µg/l chloroform, and 170 µg/l TCE (64).

Wastewater samples were collected on site in December 2002 and analyzed for VOCs using EPA Method 624. Analytical results indicated concentrations of 82.6 µg/l vinyl chloride and 38.8 µg/l TCE (74).

### **3.2 Current Sampling**

Starting on June 27, 2005, WESTON, under contract to EPA, conducted an ESI sampling effort for the Keysor site. Sampling methodology, locations, analyses, and analytical results are summarized below. The sampling event was conducted in accordance with the EPA-approved ESI Sampling and Analysis Plan (SAP) for the Keysor site (App. G). The sampling locations are shown in Figure 3. The analytical results are presented in Table 2 (June 2005 ESI Soil Sampling Results), Table 3 (July 2005 ESI Groundwater Sampling Results), Table 4 (June 2005 Sediment Sampling Results), and Appendix H (Data Validation Reports).

#### **3.2.1 Soil Sampling**

On June 27 and 28, 2005, WESTON collected 60 soil samples, including six field duplicates, from 15 locations throughout the Keysor site. The locations of the soil samples (KC-SB-1 through KC-SB-15) are presented in Figure 3. Four samples were collected at various depths (approximately 2 feet bgs, 5 feet bgs, 10 feet bgs, and 15 feet bgs) at each sample location. Two soil sample locations were located in areas that were not utilized by Keysor to conduct operations or for storage of hazardous materials to determine background concentrations. The remaining soil sample locations were located in areas of suspected contamination. Three sample locations were located in the former unlined pond area, two sample locations were within the former processing area, two sample locations were in the former 550-Plant and wastewater treatment area, two sample locations were located adjacent to the loading silos, one sample location was adjacent to Sump 10, one sample location was adjacent to Sump 8, one sample location was adjacent to Outfall 001, and one sample location was adjacent to Outfall 002. All soil samples were analyzed for VOCs using Contract Laboratory Program Analytical Services (CLPAS) Method OLM04.3. The data were validated by ICF Consulting/Laboratory Data Consultants, under contract to EPA.

WESTON advanced fifteen soil borings across the site using a direct push rig owned and operated by Tri-County Drilling, Inc. Borings were conducted by coring through the asphalt or concrete surface, if present, then advancing a 2-inch inner bore sampler tube into the soil. Soil

was collected in a dedicated acetate sleeve. A WESTON geologist logged the lithology of the core (see boring logs in Appendix J), then collected samples for laboratory analysis. VOC samples were collected first, by cutting the core with a hacksaw to expose a fresh surface, then collecting three EnCore<sup>(TM)</sup> plugs from the core. The field team also collected a moisture sample in a 4-ounce glass jar for each sample interval.

The lithology of soils observed in the soil borings (0 to 15 feet bgs) consisted predominantly of well-graded to poorly graded sands with varying amounts of gravel, silt and very minor clay. Fill material, as evidenced by anthropogenic materials (e.g. brick, concrete, glass fragments and shards), was typically evident in the first 1 to 2 feet at most locations, except for KC-SB-4 and KC-SB-5, where the entire boring appeared to be fill. Most soils were brown to dark brown in color, indicating normal, terrestrial oxidation, with the exception of a dark grey to brown organic-rich layer observed at KC-SB-1, KC-SB-2, and KC-SB-3 at a depth of approximately 14 feet bgs. Gravel and cobbles caused refusal at several locations causing the field team to step out and re-bore at a co-located boring.

After the samples were collected, the field team screened the remaining soil using a photoionization detector (PID) organic vapor probe. This was done by disturbing the soil in the acetate sleeve and inserting the PID probe into the sleeve opening. Readings above background were recorded and used to inform the laboratory of the possible need for dilution. WESTON conducted additional screening around the drilling area during boring installation, as well as other work stations for health and safety purposes.

During the course of the soil boring program, PID readings above background (0.0 to 2.2 parts per million [ppm]) were recorded in the logbook. PID readings less than 3.0 ppm were considered background due to moisture content of the soil. PID readings considered significant were measured in borings KC-SB-1, KC-SB-2, KC-SB-6, and KC-SB-13 (see Table 5). The highest readings (>5,000 ppm) were measured in soils from KC-SB-6; the PID also measured brief instances where the organic vapors exceeded the site action level in the breathing zone (>5 ppm). The field crew utilized prevalent wind conditions to minimize these effects during sampling.

For HRS purposes, an analyte is considered to be present at a concentration significantly above background if one of the following two criteria is met: 1) the analyte is detected in the site-related sample when not detected in the background samples or 2) the analyte is reported at a concentration equal to or greater than three times the maximum background level when detected in the background samples. In addition, the analytical data must be of known and documented quality. Data validation results for the Keysor ESI soil sampling data indicate that some of the reported concentrations are qualitatively acceptable but quantitatively questionable. These concentrations have been assigned J qualifiers in Table 2, Table 3, and Table 4 to indicate that the analyte was positively identified, but the associated numerical value is the approximate concentration of the analyte in the sample. The sample/analyte-specific reasons for the assignment of J qualifiers are presented in Appendix H. HRS guidance allows for the use of

some types of J-qualified data in documenting the presence of an analyte at a concentration significantly above background.

As shown in Table 2, the following VOCs were detected at concentrations significantly above background: 1,2-DCA, cis-1,2-DCE, 1,2-dichloropropane (1,2-DCP), toluene, and vinyl chloride. In addition, 2-butanone, 1,1,2-trichloro-1,1,2-trifluoroethane (Freon 113), 4-methyl-2-pentanone, TCE, and xylenes were detected. One constituent, 1,2-DCA, was detected at concentrations significantly above background ranging from 430,000 µg/kg to 1,600,000 µg/kg at sample location KC-SB-6, located in the processing area adjacent to the former drum storage area.

### **3.2.2 Groundwater Well Installation**

On June 27 through June 30, 2005, WESTON installed 5 groundwater monitoring wells (KC-GW-1 through KC-GW-5). KC-GW-1 is located in the former processing area and directly west of the former unlined pond, KC-GW-2 is located west of the former wastewater tank area and 550-Plant, KC-GW-3 is located in the western central portion of the site, KC-GW-4 is located west of the loading silos and Outfall 001, and KC-GW-5 is located in the southern portion of the site.

Borings were drilled using an air-rotary, casing hammer (ARCH) drill rig owned and operated by Layne Christensen, Inc. by advancing a bit and simultaneously pounding a casing into the boring. Cuttings were collected at five-foot intervals and logged by a geologist for lithology (see boring logs in Appendix J). No samples were collected during the boring advancement. When groundwater was encountered, the water level was allowed to equilibrate in the casing to determine the final placement of the well.

The groundwater wells were installed using a 4-inch PVC casing and a 20-foot screen interval set approximately 5 feet above, and fifteen feet below the equilibrated water level. The driller added a Number 4 sand pack as the casing was pulled up through the screen interval to a depth of two feet above the screen interval. A four-foot sanitary seal was installed using hydrated bentonite chips, then the remainder of the casing annulus was filled with a bentonite-cement grout. All wells were completed with traffic-hardened, flush-mount wellhead construction. The details of each of the five wells are presented in the well construction As-Built diagrams in Appendix K.

Soils encountered in the monitoring well borings were predominantly similar to those encountered in the more shallow soil borings. The overall lithology was dominated by well-graded sands and gravels with variable fines. Gravels and cobbles are better represented in the ARCH sampling (as opposed to the direct push) due to the more complete recovery of large clasts in the 10-inch boring. Lithologies at the western end of the site contained significant fines in the 50- to 60-foot bgs range, especially in KC-GW-3 and KC-GW-4.

Water levels in most of the wells equilibrated to depths of 2 to 5 feet above the depth where the

driller initially reported water. This may be attributed to the lag time between encountering saturated soils and the time the cuttings reach the surface. The water level at KC-GW-2, however, rose 20 feet before equilibration. The lithologies immediately above water level are typified by dense silts and clays possibly associated with fluvial activity. Groundwater at this location, and possibly KC-GW-3 may be confined by these fine-grained layers.

### **3.2.3 Well Survey**

WESTON contracted Cabrina, Hearn, and Associates (CHA) to survey the well locations and elevations at the site. CHA conducted the survey on August 22, 2005; CHA delivered a survey report and map on October 10, 2005. WESTON prepared a groundwater contour map to determine groundwater flow under the site. The survey data is presented in Appendix L and the groundwater elevation map is presented in Figure 3.

Groundwater flow contours were generated by calculating the surface of water at each well with respect to mean sea level using wellhead elevation data from the CHA survey and depth to water data from the July 2005 sampling event. The data were plotted using ArcView 3.2<sup>(TM)</sup> software and contours were interpolated using Spatial Analyst<sup>(TM)</sup>. The contouring results indicate that groundwater across the site has an east-northeast trend. These results contradict the suspected groundwater flow assumed by WESTON during the sample planning stages of this investigation based on the available information at the time (25).

During the field investigation, WESTON observed the relationship between the Quaternary alluvial sediments comprising the basin on which the Keysor workings are constructed and the Plio-Pleistocene alluvial gravels and sands of the surrounding hills to the east. The alluvium of the surrounding hills is composed of similar materials to the sediments in the basin, such that the provenance of the coarse fractions of the basin sediments is likely derived from the surrounding hills.

In an effort to address the question of whether there is hydraulic communication between the basin sediments and the hillside sediments, WESTON geologist, Ben Castellana, inspected exposed sections of the hillside in order to make a first-order determination of hydraulic conductivity based on physical observations, such as lithology, grading, and compaction. The alluvium in the hill sides consists primarily of sands, gravels, and cobbles (some in excess of 18 inches in diameter) that are poorly consolidated. Caliche and other cementing minerals are present along some horizons, but the soils are generally of the type and compaction that generally define geologic units as hydrologically transmissive. Based on these observations, there is no evidence to suggest that groundwater does not communicate freely to the east of the site. The Whittaker Corp-Bermite Division (CAD064573108) lies directly east of this site.

### **3.2.4 Monitoring Well Development and Sampling**

On July 6 and 7, 2005 WESTON returned to the site to develop and sample the wells. Before

development, each well was gauged for depth. Development consisted of surging the well for a minimum of 30 minutes. Subsequently, the wells were purged at a rate of approximately 1 gallon per minute for a minimum of three well volumes, using the calculations in the SAP. After three well volumes were extracted, the field crew took turbidity, temperature, and pH readings every four to five minutes. When the readings equilibrated, the well was ready for sampling.

WESTON sampled the wells using a dedicated bailer and twine for each well. Samples were collected into three 40-milliliter vials and immediately iced for preservation. All groundwater samples were analyzed for VOCs using CLPAS Method OLC03.2. The data were validated by ICF Consulting/Laboratory Data Consultants, under contract to EPA.

Based on the discovery of groundwater flowing in an opposing direction than originally assumed, monitoring wells KC-GW-2 through KC-GW-5 are all representative of background groundwater concentrations, and KC-GW-1 is located downgradient of these wells. As shown in Table 3, the following VOCs were detected at concentrations significantly above background: bromodichloromethane, chloroethane, dibromochloromethane, 1,1-DCA, 1,2-DCA, 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, and vinyl chloride.

The July 2005 groundwater sampling event was conducted in accordance with the EPA-approved ESI SAP for the Keysor site, except for the following deviations: monitoring wells KC-GW-2 through KC-GW-5 are upgradient and all representative of background concentrations.

### **3.2.5 Sediment Sampling**

On June 30, 2005, WESTON collected two sediment samples (KC-SED-1 and KC-SED-2), including one field duplicate, from an unlined ditch on the western portion of the Keysor site. Both samples were analyzed for VOCs using CLPAS Method OLM04.3. The data were validated by ICF Consulting/Laboratory Data Consultants, under contract to EPA.

As shown in Table 4, chloroform and TCE were detected at sample location KC-SED-1 having concentrations of 94 µg/kg and 14 µg/kg, respectively. No background samples were collected for this matrix.

## **4.0 HAZARD RANKING SYSTEM FACTORS**

### **4.1 Sources of Contamination**

Hazardous substance sources associated with the Keysor site include, but may not be limited to:

- VOC-contaminated soil. As shown in Table 2, results of the June 2005 ESI soil sampling event indicate the presence of VOCs at concentrations significantly above background at multiple sample locations. One constituent, 1,2-DCA, was detected at concentrations significantly above background ranging from 430,000 µg/kg to 1,600,000 µg/kg at

sample location KC-SB-6, located in the former processing area adjacent to the former drum storage area. 1,2-DCA was used as a cleaning solvent on the Keysor site until at least 1980 (3).

- Multiple onsite spills. Between October 2001 and October 2002, numerous onsite spills had been documented with the LACFD Health Hazardous Materials Division. Wastewater and process water suspected of containing vinyl acetate, vinyl chloride, and/or TCE were the most common materials spilled (30, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58).

## 4.2 Groundwater Pathway

In determining a score for the groundwater migration pathway, the HRS evaluates: 1) the likelihood that sources at a site actually have released, or potentially could release, hazardous substances to groundwater; 2) the characteristics of the hazardous substances that are available for a release (i.e., toxicity, mobility, and quantity); and 3) the people (targets) who actually have been, or potentially could be, impacted by the release. For the targets component of the evaluation, the HRS focuses on the number of people who regularly obtain their drinking water from wells that are located within 4 miles of the site. The HRS emphasizes drinking water usage over other uses of groundwater (e.g., food crop irrigation and livestock watering), because, as a screening tool, it is designed to give the greatest weight to the most direct and extensively studied exposure routes.

### 4.2.1 Hydrogeological Setting

The Keysor site is located along the south side of the Santa Clara River Valley East Groundwater Subbasin in the Santa Clara River Valley Groundwater Basin. The subbasin is bordered on the north by the Piru Mountains, on the west by the Modelo and Saugus Formations and a constriction in the alluvium, on the south by the Santa Susana Mountains, and on the south and east by the San Gabriel Mountains. Groundwater is found in the alluvium, terrace deposits, and the Saugus Formation, and is generally unconfined. The alluvial aquifer is primarily recharged by infiltration of runoff waters in the Santa Clara River with additional natural recharge from percolation of rainfall and subsurface inflow. Groundwater from the alluvium and Saugus Formation is used for municipal purposes (75).

The Keysor site is situated in the foothills of the San Gabriel Mountains within a tributary drainage of the South Fork Santa Clara River. The site is underlain by recent alluvium and possible terrace deposits, overlying the Saugus Formation. The Saugus Formation is exposed in the hills surrounding the east and north of the site. The alluvium consists of unconsolidated, poorly bedded, poorly sorted to sorted sand, gravel, silt, and clay with cobbles and boulders (75).

Groundwater beneath the site was encountered between 50 and 59 feet bgs. Groundwater within the alluvium generally flows east-northeast. Geologic materials in the unsaturated zone between

ground surface and the top of the aquifer are primarily well-graded to poorly graded sands with varying amounts of gravel, silt and very minor clay, and the net precipitation in the area is approximately 15 inches annually (75).

#### **4.2.2 Groundwater Targets**

The nearest active drinking water well is Well Q-2, located approximately 0.75 mile north of the Keysor site. This well is owned and operated by the Valencia Water Company (App, C-8).

The Valencia Water Company operates a blended drinking water system that consists of 19 wells that serve approximately 78,000 people. The Valencia Water Company obtains 50 percent of its drinking water from groundwater. Fifty percent is surface water. No one well contributes greater than 40 percent to the system. Eighteen of the 19 wells operated by the Valencia Water Company are within 4 miles of the site (App. C-8).

The Santa Clarita Water Company operates a blended drinking water system that consists of 12 wells that serve approximately 80,000 people. The Santa Clarita Water Company obtains 50 to 75 percent of its drinking water from groundwater. The remaining water distributed is surface water. No one well contributes greater than 40 percent to the system. Three of the 12 wells operated by the Santa Clarita Water Company are within 4 miles of the site (App. C-9).

The Newhall County Water District operates a blended drinking water system that consists of 2 wells that serve approximately 12,167 people. The Newhall County Water District obtains 60 percent of its drinking water from groundwater. Forty percent is surface water. No one well contributes greater than 40 percent to the system. Both drinking water wells operated by the Newhall County Water District are within 4 miles of the site (App. C-10).

Although the EPA Region 9 GIS Report for Keysor indicates additional water purveyors operating wells within 4 miles of the site, it was not necessary to evaluate further systems for this assessment based on the HRS model (76).

#### **4.2.3 Groundwater Pathway Conclusion**

A release of VOCs, specifically 1,2-DCA, cis-1,2-DCE, and vinyl chloride, has been established, based on the results of the June and July 2005 ESI sampling effort. For HRS purposes, a release to groundwater is established when a hazardous substance is detected in a hydraulically downgradient well at a concentration significantly above background levels, and some portion of the release is attributable to the site. A hazardous substance is considered to be present at a concentration significantly above background levels when one of the following two criteria is met: (1) the hazardous substance is detected in the contaminated sample, when not detected in the background samples or (2) the hazardous substance is detected in the contaminated sample at a concentration equal to or greater than three times the maximum background level, when detected in the background samples.

Results from the July 2005 ESI groundwater sampling event are presented in Table 3. As shown in Figure 3, three of the monitoring wells are located along the western portion of the site (KC-GW-2, KC-GW-3, and KC-GW-4), one monitoring well is located in the south-central portion of the site (KC-GW-5), and one monitoring well is located in the former processing area west of the former unlined pond (KC-GW-1). All samples were analyzed for VOCs using CLPAS Method OLC03.2. Water level measurements collected during the well survey conducted in August 2005 indicate that the direction of groundwater flow is toward the east-northeast. Based on this groundwater flow direction, wells KC-GW-2, KC-GW-3, KC-GW-4, and KC-GW-5 are representative of background wells, while well KC-GW-1 is considered hydraulically downgradient. 1,2-DCA, cis-1,2-DCE, and vinyl chloride were reported in the downgradient well at concentrations significantly above background. This release is attributable, at least in part, to the Keysor site, because 1,2-DCA, and cis-1,2-DCE have been detected at elevated concentrations in onsite soil samples. In addition, vinyl chloride was used as a raw material in Keysor's manufacturing process for approximately 45 years (see Section 3.2 for more information on the soil sampling effort).

Groundwater beneath the site was encountered between 50 and 59 feet bgs. Geologic materials in the unsaturated zone between ground surface and the top of the aquifer are primarily well-graded to poorly graded sands with varying amounts of gravel, silt and very minor clay. There are at least 23 municipal drinking water wells within 4 miles of the site that serve a population of approximately 170,167 (App. C-8, C-9, C-10).

#### **4.3 Surface Water Pathway**

In determining the score for the surface water pathway, the HRS evaluates: 1) the likelihood that sources at a site actually have released, or potentially could release, hazardous substances to surface water (e.g., streams, rivers, lakes, and oceans); 2) the characteristics of the hazardous substances that are available for a release (i.e., toxicity, persistence, bioaccumulation potential, and quantity); and 3) the people or sensitive environments (targets) who actually have been, or potentially could be, impacted by the release. For the targets component of the evaluation, the HRS focuses on drinking water intakes, fisheries, and sensitive environments associated with surface water bodies within 15 miles downstream of the site.

The South Fork Santa Clara River, a tributary to the Santa Clara River, is located approximately 0.5 mile west of the Keysor site. The Santa Clara River generally does not empty into an ocean and instead percolates back into the groundwater basin. In August 2005, two Federally designated endangered species, the Santa Ana sucker and the Arroyo chub, were observed in the Santa Clara River (App. B, App. C-11).

#### **4.4 Soil Exposure and Air Pathways**

In determining the score for the soil exposure pathway, the HRS evaluates: 1) the likelihood that there is surficial contamination associated with the site (e.g., contaminated soil that is not

covered by pavement or at least 2 feet of clean soil); 2) the characteristics of the hazardous substances in the surficial contamination (i.e., toxicity and quantity); and 3) the people or sensitive environments (targets) who actually have been or potentially could be, exposed to the contamination. For the targets component of the evaluation, the HRS focuses on populations that are regularly and currently present on or within 200 feet of surficial contamination. The four populations that receive the most weight are residents, students, daycare attendees, and terrestrial sensitive environments.

In determining the score for the air migration pathway, the HRS evaluates: 1) the likelihood that sources at a site actually have released, or potentially could release, hazardous substances to ambient outdoor air; 2) the characteristics of the hazardous substances that are available for a release (i.e., toxicity, mobility, and quantity); and 3) the people or sensitive environments (targets) who actually have been, or potentially could be, impacted by the release. For the targets component of the evaluation, the HRS focuses on regularly occupied residences, schools, and workplaces within 4 miles of the site. Transient populations, such as customers and travelers passing through the area, are not counted.

Contaminated soil, resulting from historic operations, is still present on site (see Table 2). There are no daycare centers, regularly occupied residences, or sensitive environments on site. In addition, the site is fenced and inaccessible to the public. However, its surface is not entirely paved (App. B).

## 5.0 EMERGENCY RESPONSE CONSIDERATIONS

The National Contingency Plan [40CFR 300.415 (b) (2)] authorizes the EPA to consider emergency response actions at those sites that pose an imminent threat to human health or the environment. For the following reason, a referral to Region IX's Emergency Response Section does not appear to be necessary:

- Keysor is no longer operating on the site. The property is fenced and inaccessible to the public (App. B).

## 6.0 SUMMARY

The Keysor site is located at 26000 Springbrook Avenue, Saugus, California. The site is approximately 32 acres and is bound to the north by undeveloped land and to the east by Whittaker Corp-Bermite Division (CAD064573108). Small commercial and industrial businesses surround the site to the south and west. During the time of Keysor's operations, approximately 24 acres of the site consisted of undeveloped hills covered with grasses and shrubs. The remaining 8 acres included several structures and processing areas. In April 2004, the Keysor site underwent demolition and reconstruction activities, and numerous structures on site were removed.

From 1958 to 2003, Keysor operated a polyvinyl chloride (PVC) manufacturing facility. By 1974, operations included record manufacturing and the production of PVC and polyvinyl acetate resins and compounds. The production processes involved polymerization, flash drying, extrusion, and compression molding. Raw materials used in these operations included vinyl chloride, vinyl acetate monomers, TCE, and toluene. In addition, 1,2-dichloroethane (1,2-DCA) was used to clean the polymer reactors until approximately 1980.

During early operations, Keysor used an unlined pond located on site for disposal of waste liquids and solids produced from the reactor area. As early as January 1961, it was observed that the disposal of wastewater to the pond was inadequate due to excess water flowing to adjacent properties. The Los Angeles County Board of Supervisors ordered the elimination of the wastewater pond in April 1977; however, the pond continued to be used through September 1977 when sampling of the pond indicated elevated concentrations of 1,2-DCA and vinyl acetate.

Numerous regulatory agencies have had active involvement with the Keysor site. Since June 1977, Keysor had been a National Pollutant Discharge Elimination System (NPDES) permit holder through the Los Angeles Regional Water Quality Control Board (RWQCB). The Keysor site is listed in the Department of Toxic Substances Control (DTSC) Site Cleanup - Site Mitigation and Brownfields Reuse Program Database (Calsite ID: 19280025). In February 1995, a No Further Action (NFA) for Site Mitigation Operations decision was made. The Los Angeles County Certified Unified Program Agency has conducted on-site inspections of the Keysor site and issued several notices of violation. The County Sanitation Districts of Los Angeles have been involved with the Keysor site since the early 1960s, issuing industrial wastewater discharge permits and conducting industrial wastewater sampling oversight.

The South Fork Santa Clara River, a tributary to the Santa Clara River, is located approximately 0.5 mile west of the Keysor site. The Santa Clara River generally does not empty into an ocean and instead percolates back into the groundwater basin. In August 2005, two Federally designated endangered species, the Santa Ana sucker and the Arroyo chub, were observed in the Santa Clara River.

Contaminated soil, resulting from operations on the Keysor site, is still present on site (see Table 2). However, there are no permanent residences, schools, daycare centers, or regularly occupied workplaces currently on site.

The following pertinent Hazard Ranking System (HRS) factors are associated with the site:

- A release from the Keysor site to groundwater has been established. Results of the June and July 2005 Expanded Site Inspection (ESI) sampling effort indicate the presence of VOCs at concentrations significantly above background (see Table 2 and Table 3). Vinyl chloride, 1,2-DCA, and cis-1,2-dichloroethene (cis-1,2-DCE) were reported in the downgradient well at concentrations significantly above background. This release is attributable, at least in part, to the Keysor site, because 1,2-DCA, and cis-1,2-DCE have

been detected at elevated concentrations in onsite soil samples. In addition, vinyl chloride was used as a raw material in Keysor's manufacturing process for approximately 45 years.

- The alluvial aquifer and the Saugus Formation are major sources for drinking water in the Saugus area. The area has experienced substantial growth in recent years. Three water purveyors operate 23 drinking water wells within 4 miles of the site. These wells are part of blended systems that serve approximately 170,167 people. For HRS purposes, these aquifers are considered interconnected.

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